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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,830	01/24/2007	Takeshi Karato	2593-016SPUS1	6227
2292 7590 12/15/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER SCOTT, ANGELA C				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
12/15/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

### Office Action Summary

**Application No.**

10/577,830

**Applicant(s)**

KARATO ET AL.

**Examiner**

Angela C. Scott

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 October 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2,3,5-13 and 15 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 2,3,5-13 and 15 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SI/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

Applicant's reply of October 1, 2008 has been fully considered. Claim 13 has been amended and claim 14 has been cancelled. Claims 2, 3, 5-13, and 15 are pending.

#### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 2, 3, 5-9, 11-13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konno et al. (WO 02/20655) ("Konno 1") in view of Matsuda et al. (WO 03/085010) and Konno et al. (US 2002/0111418) ("Konno 2"). For convenience, the citations below for Konno 1 and Matsuda et al. are taken from the English language equivalents, US 2004/0030027 and US 2005/0171276, respectively.

Regarding claims 5-8, 13, and 15, Konno 1 teaches a process of making a composite material comprising mixing an aqueous dispersion of a diene-based rubber, such as a styrene-butadiene copolymer rubber (¶22) with a styrene content of preferably 15-40% by mass (¶44), with an aqueous dispersion of an inorganic compound (¶68, 71), such as silica (¶53); then, drying (heating) the mixture to a temperature of about 130° C (¶75, 161); finally, compounding the mixture with another rubber component, such as polybutadiene rubber, to form a rubber composition. It is known that polybutadiene rubber typically has a glass transition temperature of less than -90° C. Additionally, it is known that the glass transition temperature of styrene-butadiene copolymer rubber is about -50° C when the bound styrene content is about 24%, which amount of bound styrene is taught by the reference. As the styrene content is increased, the T<sub>g</sub> also increases. With these glass transition temperatures for polybutadiene and the styrene-butadiene rubbers, the limitation regarding the absolute value between the glass transition temperatures being 3 to 100° C, more preferably 10 to 95° C, is met. Additionally, Konno 1 teaches that the silica preferably has a specific surface area (BET value) of 100-300 m<sup>2</sup>/g (¶81).

Konno 1 does not teach that the mixture contains at least 30 weight % of toluene insoluble components. However, Matsuda et al. does teach a styrene resin composition where the content of components which are insoluble in toluene is in the range of from 5 to 75% by

weight (¶496). Konno 1 and Matsuda et al. are analogous art because they are from the same field of endeavor, namely that of styrene resin/rubber compositions. At the time of the invention, a person of ordinary skill in the art would have found it obvious to have a content of components which are insoluble in toluene in the above range, as taught by Matsuda et al., in the mixture, as taught by Konno 1, and would have been motivated to do so because when the content is lower than 5% by weight, the impact resistance becomes poor and when its too high, the fluidity becomes lowered (¶496).

Konno 1 does not teach that mixing the dispersions in the presence of a cationic polymer having a weight average molecular weight of 1,000 to 1,000,000. However, Konno 2 does teach a mixture of dispersions of a diene based rubber and silica being mixing with a cationic polymer (¶64). Konno 1 and Konno 2 are analogous art because they are from the same field of endeavor, namely that of diene based rubber/inorganic compound composites. At the time of the invention, a person of ordinary skill in the art would have found it obvious to use a cationic polymer, as taught by Konno 2, in the composition, as taught by Konno 1, and would have been motivated to do so because the cationic polymer induces coagulation between the two dispersions (¶64).

The weight average molecular weight of the cationic is not explicitly taught in the reference. However, the cationic polymer of the reference is serving the same purpose in the reference as is the cationic polymer in the instant application. Moreover, the molecular weight range is very broad. Therefore, since the polymer is acting in the same capacity in the reference and in the instant application, and the molecular weight range is so broad, the molecular weight of the cationic polymer of the reference is deemed to fall within the claimed molecular weight range.

Regarding claims 2-3, Konno et al. additionally teaches that the amount of silica introduced into the composite is within a range of 5-200 parts by mass per 100 parts by mass of the diene based rubber (¶61).

Regarding claim 9, Konno et al. additionally teaches that a filler is used in the rubber composition in an amount of 5-85 parts by mass based on 100 parts by mass of the rubber component (¶82).

Regarding claim 11, Konno et al. additionally teaches that the composition produced by the method also comprises a crosslinking agent (¶76).

Regarding claim 12, Konno et al. additionally teaches an article produced from the composition (¶89).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Konno et al. (WO 02/20655) ("Konno 1") in view of Matsuda et al. (WO 03/085010) and Konno et al. (US 2002/0111418) ("Konno 2") as applied to claim 13 above, and further in view of von Hellens (US 6,407,153).

Konno 1 teaches the basic process of claim 13. Konno 1 does not explicitly teach that the weight ratio between the two rubbers is 95:5 to 5:95. However, von Hellens teaches a composition where the ratio of styrene-butadiene rubber to polybutadiene rubber is 70:30 (Col. 17, lines 14-15). Konno 1 and von Hellens are analogous art because they are from the same field of endeavor, namely that of styrene butadiene/silica composites. At the time of the invention, a person of ordinary skill in the art would have found it obvious to use the rubbers in these ratios, as taught by von Hellens, in the composition, as taught by Konno et al., and would have been motivated to do so in order to improve traction, abrasion and rolling resistance properties of the articles made from the composition (Col. 2, lines 5-10).

Applicant's arguments filed October 1, 2008 have been fully considered but they are not persuasive.

Applicants argue that Konno '418 teaches an aqueous dispersion of a silicate, not silica, being mixed with a dispersion of a diene rubber. Applicant states that when these dispersions are mixed, silica is formed, but that this method does not allow for the particle size of the silica to be controlled. However, Konno '418 does teach an aqueous dispersion containing a silicic acid compound (silica) combining with a diene rubber dispersion (¶62). With this method, the size of the silica could be controlled. Therefore, this combination of references is valid.

#### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela C. Scott whose telephone number is (571) 270-3303. The examiner can normally be reached on Monday through Friday, 8:30am to 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/  
Supervisory Patent Examiner, Art Unit 1796

/A. C. S./  
Examiner, Art Unit 1796